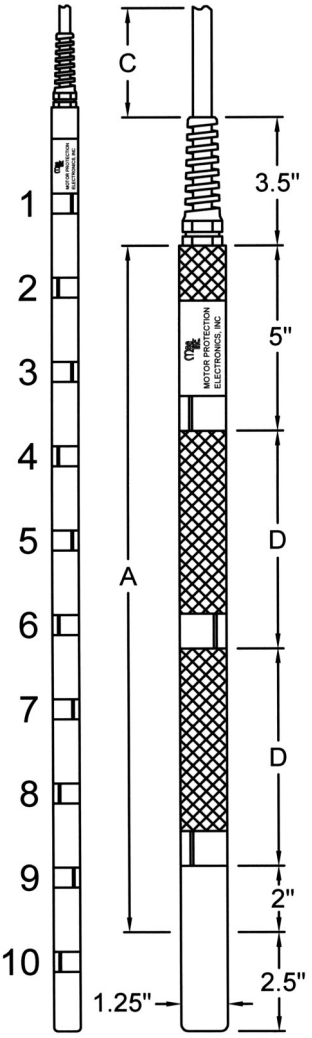
LEVEL PROBE

TYPICAL APPLICATION

For use with any of MPE's pump controllers or conductance relays designed to operate with conductance probe.

MADE IN THE U.S.A.



DESCRIPTION

The Level Probe provides a rugged, safe, reliable and cost-effective means to measure liquid level for waste water pumping applications. The Level Probe may be ordered with one, two, three or ten electrodes with various spacing in between.

The Level Probe is typically connected to a pump controller (or conductance relay) that is designed to monitor a conductance probe and perform level measurement. The level is detected when the liquid level is high enough to touch one or more of the stainless steel electrodes on the Level Probe. The controller (or conductance relay) sends out a level sense signal to each electrode on the Level Probe. The signal typically consists of an ±8V or ±12V square wave, capable of supplying no more than 1.5mA. When the liquid being measured touches one of the electrodes, the square wave signal is diverted to ground through the conductive liquid. The change in the signal is detected by the control device and used to determine the liquid level.

The Level Probe is suitable for use in conductive liquids such as waste water, and should not be used in storm water, well water, lake water, or other liquids which are not conductive enough to provide a reliable level measurement.

All non single point probes come standard with a LPB-1 (small level probe bracket) and S Hook.

SPECIFICATIONS

Electrode Material:	High Grade Stainless Steel Alloy
Probe Casing Material:	PVC
Cable Material	
Multi-Electrode:	PVC/PVC
Single-Electrode:	EPDM
Operating Temp:	+32 to +140 °F

UL 913

UL FILE # E189808

Intrinsically Safe; For use in Class 1, Groups A, B, C, D. Hazardous Locations when installed with suitable Intrinsically Safe Barrier, in accordance with Control Drawing No. 0304.

ORDERING INFORMATION

Part Number: **LP - A - B - C**

Probe Length (inches)
Number of Electrodes
Cable Length (feet)

Available Combinations:

Probe Length (inches) A	Number of Electrodes B	Spacing Between Electrodes (inches) D
7	1	X
19	3	6
52	10	5
61	10	6
79	10	8
97	10	10
115	10	12

Contact M.P. Electronics for custom probe availability.

Cable Length (feet) C 50, 100

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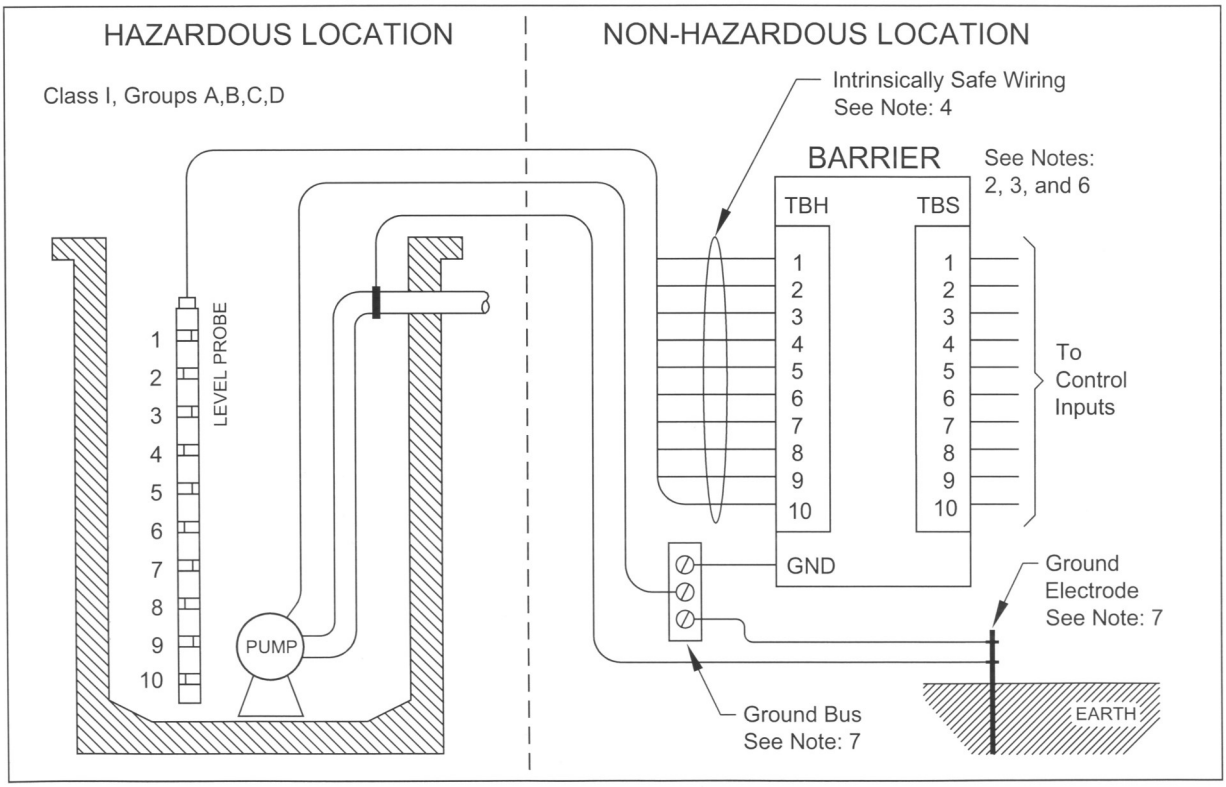
LEVEL PROBE

Control Drawing No. 0304 Page 1 of 2 TYPICAL LIFT STATION APPLICATION



Notes for Control Drawing 0304 Page 1 of 2:

1. Level Probe Entity Parameters: Vmax = 30.3 V Imax = 88.6 mA Pmax = 672 mW Ci = 6 nF Li = 20 µH
2. The Barrier output current must be limited by a resistor such that the output voltage versus current plot is a straight line drawn between the open-circuit voltage and the short-circuit current.
3. The Barrier must be third party listed as providing intrinsically safe circuits for the application, and have Voc not exceeding Vmax, Isc must not exceeding Imax, and Po of the Barrier must be less than or equal to the Pmax of the Level Probe, as shown in Table 1.
4. The capacitance and inductance of the cable from the Level Probe to the Barrier shall be calculated and must be included in the system calculations as shown in Table 1. Cable capacitance, Ccable, plus intrinsically safe equipment capacitance, Ci, must be less than the marked capacitance, Ca, shown on the Barrier used. The same applies for inductance (Lcable, Li and La respectively). Where cable capacitance and inductance per foot are not known, the following values shall be used: Ccable = 60 pF/ft, Lcable = 0.2 µH/ft.
5. If Po of the Barrier is not known, it may be calculated using the formula Po = (Voc * Isc)/4.
6. The Barrier must be installed in accordance with its manufacturer's control drawing and Article 504 of the National Electric Code (ANSI/NFPA 70) for installation in the United States, or Section 18 of the Canadian Electrical Code for installations in Canada.
7. The hazardous location ground and the Barrier ground must be connected to the ground bus in the power distribution panel. The ground bus must be connected to a suitable ground electrode per the National Electric Code (ANSI/NFPA 70) or other local codes, as applicable. The resistance of the ground path from the Barrier to the ground electrode must be less than 1 Ohm.
8. This associated apparatus (Barrier) must not be used in combination with another associated apparatus unless permitted by the associated apparatus certification.

Level Probe Part Number: LP - ___ - ___ - ___

Probe Length (inches)
Number of Electrodes 1, 2, 3, or 10
Cable Length (feet)

Revision Date: 7-13-10

Table 1

Level Probe		Barrier
Vmax	≥	Vt
Imax	≥	It
Pmax	≥	Po
Ci + Ccable	≤	Ca
Li + Lcable	≤	La

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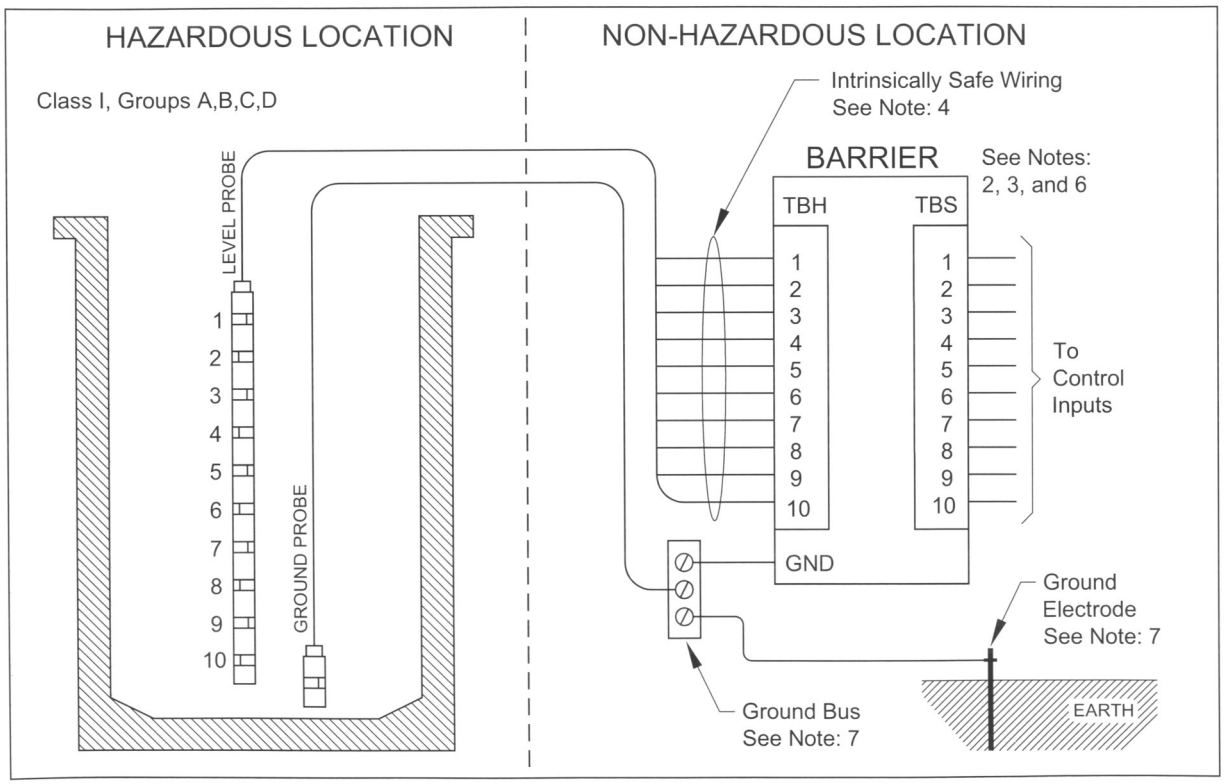
UNGROUNDED TANK APPLICATION



Notes for Control Drawing 0304 Page 2 of 2:

1. Level Probe Entity Parameters: Vmax = 30.3 V Imax = 88.6 mA Pmax = 672 mW Ci = 6 nF Li = 20 µH
2. The Barrier output current must be limited by a resistor such that the output voltage versus current plot is a straight line drawn between the open-circuit voltage and the short-circuit current.
3. The Barrier must be third party listed as providing intrinsically safe circuits for the application, and have Voc not exceeding Vmax, Isc must not exceeding Imax, and Po of the Barrier must be less than or equal to the Pmax of the Level Probe, as shown in Table 1.
4. The capacitance and inductance of the cable from the Level Probe to the Barrier shall be calculated and must be included in the system calculations as shown in Table 1. Cable capacitance, Ccable, plus intrinsically safe equipment capacitance, Ci, must be less than the marked capacitance, Ca, shown on the Barrier used. The same applies for inductance (Lcable, Li and La respectively). Where cable capacitance and inductance per foot are not known, the following values shall be used: Ccable = 60 pF/ft, Lcable = 0.2 µH/ft.
5. If Po of the Barrier is not known, it may be calculated using the formula Po = (Voc * Isc)/4.
6. The Barrier must be installed in accordance with its manufacturer's control drawing and Article 504 of the National Electric Code (ANSI/NFPA 70) for installation in the United States, or Section 18 of the Canadian Electrical Code for installations in Canada.
7. The hazardous location Ground Probe and the Barrier ground must be connected to the ground bus in the power distribution panel. The ground bus must be connected to a suitable ground electrode per the National Electric Code (ANSI/NFPA 70) or other local codes, as applicable. The resistance of the ground path from the Barrier to the ground electrode must be less than 1 Ohm.
8. This associated apparatus (Barrier) must not be used in combination with another associated apparatus unless permitted by the associated apparatus certification.

Level Probe Part Number: LP - ___ - ___ - ___

Probe Length (inches)
Number of Electrodes 1, 2, 3, or 10
Cable Length (feet)

Ground Probe Part Number: LP - 7 - 1 - Cable Length

Table 1

Level Probe		Barrier
Vmax	≥	Vt
Imax	≥	It
Pmax	≥	Po
Ci + Ccable	≤	Ca
Li + Lcable	≤	La

Revision Date: 7-13-10

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